CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 85-67

WASTE DISCHARGE REQUIREMENTS FOR:

RHONE-POULENC, INCORPORATED AND ZOECON CORPORATION, EAST PALO ALTO, SAN MATEO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. Zoecon Corporation is the current owner of a 5.19 acre site located at 1990 Bay Road in the City of East Palo Alto (Attachments 1 and 2) which has been used for industrial purposes for over 60 years. Zoecon has occupied the site from 1972 to the present for the purpose of formulating and manufacturing insect control chemicals.

2. Prior to 1926 the site was occupied by Reed Zinc Company whose activities are unknown. From 1926 to 1964 the site was occupied by Chipman Chemical Company for the production and formulation of herbicides including sodium arsenite compounds. In 1964, Rhodia, Inc. acquired Chipman and its operations. In 1971 the Chipman operation was shut down and the following year the property was sold to Zoecon Corperation. Rhodia subsequently changed its name to Rhone-Poulenc, Inc. in 1978.

3. Sodium arsenite was formulated by Chipman and Rhodia in an underground tank located along the railroad spur while some of the wastes from this process were disposed of in a shallow sludge pond located on the northeast portion of the property (Attachment 3). Contaminated surface runoff from the site has discharged and still poses a potential to discharge onto adjoining land including a non-tidal marsh.

4. Zoecon Corporation contends that the chemicals used in their manufacturing and formulating operations are unrelated to the contaminants found on the site. Chipman Chemical Company and Rhodia, Inc. are known to have produced arsenical pesticides at that site and are the probable source of the contaminants found in the soil and ground water both on-site and on adjacent properties.

5. Zoecon Corporation has legal title to a substantial portion of the area where the contaminants are concentrated and therefore has certain legal responsibilty for any investigation or remedial action.

6. Rhone-Poulenc, Inc. and Zoecon Corporation are hereinafter referred to as the dischargers.

7. The site is located about 2000 feet east of San Francisco Bay and about 4500 feet northwest of San Francisquito Creek, a tributary of the Bay.

8. Initial site investigations conducted in 1981 by Zoecon revealed heavy metal contamination of the soil and ground water (including arsenic, lead, cadmium, selenuim and mercury) in excess of background levels. This contamination resulted from the activities described in Finding 3, above. Arsenic was used as an indicator of heavy metal contamination in subsequent investigations because its concentrations in the soil and ground water were much higher and more widespread than other metals and because the other metals are minor components of the arsenic ores used at the site.

9. The Board adopted Cleanup and Abatement Order (CAO) No. 82-001, and subsequent revision Nos. 82-002, 82-005 and 83-012, requiring the dischargers to determine the lateral and vertical extent of heavy metals and organic compounds in the soil and ground water both on- and off-site. The CAO also required the dischargers to submit and implement remedial measures to mitigate the contamination.

10. The dischargers have complied with the CAO and its revisions with regard to the definition of the extent of the soil and ground water contamination and submittal of remedial action reports.

11. The findings of several investigations performed pursuant to the CAO and its revisions were submitted in a report from the discharger's consultant titled, "Hydrogeologic and Soil Investigations, 1990 Bay Road Site, East Palo Alto, California" dated January 12, 1984. Studies revealed the following:

a) A shallow aquifer exists as two zones between 5 and 35 feet below ground surface. The shallow aquifer is underlain by about 100 feet of low permeability clay which separates it from a deeper aquifer used further inland for water supply. The background water quality of the shallow aquifer is poor and therefore, its beneficial uses may be limited due to salt water intrusion from the Bay. The deep aquifer is of drinking water quality in areas of East Palo Alto, Palo Alto and Menlo Park, but is of unknown quality below the site;
b) Arsenic-contaminated ground water in excess of 5 mg/l extends over about 3.7 acres of the shallow aquifer beneath the site and beneath a portion of the adjacent property to the south (Attachment 4);
c) Arsenic-contaminated soil in excess of 500 mg/l extends over about 5.4 acres and is predominantly located at depths above the water table (Attachment 5);
d) No significant organic contamination was detected in on-site monitoring wells;
e) The direction of ground water flow in the shallow aquifer is generally toward the south and southwest with some evidence of seasonal fluctuations;
f) The rate of ground water flow in the shallow aquifer was estimated to be in the range of 10 to 60 feet per year. The calculated rate of arsenic movement in the more permeable deposits in the upper 40 feet is no more than about 4 feet per year. The average rate of arsenic movement is about one foot per year.

12. The dischargers were provided guidance from the Board on the cleanup of soil and ground water contamination. This guidance consisted of two reports titled, "Regional Board Staff Guidelines With Respect To Establishing A Procedure To Identify Water Quality Objectives For Hazardous material Site Cleanup" and "Regional Board Consideration of Ground Water Contamination Cases" as well as all applicable plans and policies contained in the Basin Plan.

13. Rhone-Poulenc's mitigation report titled, "Evaluation of Corrective Measure Plan for the 1990 Bay Road Site" was received November 28, 1984. Zoecon's mitigation report titled," An Analysis of Alternative Remedial Plans for Zoecon/Rhone-Poulenc Property, 1990 Bay Road Site" was received December 7, 1984. The reports were based on relevent state policies and guidelines and evaluated a number of alternative corrective measures to monitor, remove, control and/or contain contaminated materials on the site and adjacent areas.

14. The dischargers' mitigation alternatives as required by the guidelines range in cost from $230,000 for a plan which includes only long-term water quality monitoring to over $28,000,000 for removal of 90% of the contaminated soil, ground water treatment and long-term monitoring. The dischargers conclude that complete cleanup of the contaminated soil and ground water above background is neither technically nor economically feasible since it would result in a total cost of $40,000,000 and require total demolition of Zoecon's facilities.

15. The dischargers were unable to agree upon implementation of a common remedial action plan among the alternatives considered. The alternative recommended by Rhone-Poulenc includes grading, paving, providing surface drainage control and long-term ground water monitoring on the site and adjacent properties. It is based on their view that the contamination present at the site will stabilize and will not threaten to degrade existing or potential beneficial uses of waters of the state. The recommendation made by Zoecon addresses only the Zoecon-owned portion of the site and includes excavation of on-site soils having arsenic concentrations in excess of 500 ppm and the installation of a ground water extraction and treatment system to remove contaminants from the shallow ground water aquifer.

16. The dischargers' mitigation reports state that if the ground water contamination is left untreated and/or uncontrolled at the site it is likely that in several hundred years it will migrate by some route to San Francisco Bay.

17. The Department of Water Resources records indicate that there are three private wells in the shallow ground water zone within 3000 feet southwest of the site whose current status is unknown. Since prior to the late 1940's this area was used primarily for agricultural purposes there may also be a number of improperly abandoned wells which may provide a conduit for salt water and contaminants to migrate from the shallow to the deep aquifer. The nearest of the known abandoned wells appear to be within 1000 feet of the site, however, the exact locations of all the abandoned wells is not known.

18. The Board adopted a revised Basin Plan dated July 21, 1982 which prohibits the discharge of all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to the waters of the Basin.

19. The existing and potential beneficial uses of the ground water underlying and in the vicinity of the facility include:
a. municipal supply
b. industrial process supply
c. industrial service supply
d. agricultural uses
The beneficial uses of the shallow ground water zone may be limited due to salt water intrusion from San Francisco Bay.

20. The existing and potential beneficial uses of the surface waters (San Francisco Bay and San Francisquito Creek) and marshes include:
a. contact and non-contact water recreation
b. warm and cold fresh water habitat
c. fish migration and spawning
d. commercial and sport fishing
f. rare and endangered species preservation
g. estuarine habitat

21. Ground water quality in the shallow zone has been degraded within the plume of arsenic contamination at and in the immediate vicinity of the site.

22. Existing and potential beneficial uses of currently uncontaminated ground water in the vicinity of the site within the shallow and deep aquifers could be adversely affected if the spread of contamination remains uncontrolled.

23. Even though it is not feasible to acheive complete cleanup, the threat of additional adverse impacts can be prevented by controlling the spread of ground water contamination. The specific measures which will be needed to achieve this are not specified in this Order pursuant to section 13360 of the California Water Code.

24. Determinations concerning the risk of contamination to public health and safety at the site will be made by the State Department of Health Services, Toxic Substances Control Division (DOHS), pursuant to its requirements.

25. Adequate grading and paving of the ground surface to prevent rainfall infiltration and contaminated surface runoff from leaving the site does not exist.

26. The Board has notified all interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge.

27. The Board, at a public meeting, heard and considered all comments pertaining to this discharge, investigation and cleanup.

28. The permit is exempt from the provisions of CEQA under section 15304, Title 14, of the California Administrative Code.

IT IS HEREBY ORDERED, that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. The presence of arsenic in excess of California's drinking water standard in the shallow ground water beyond the present area of contamination is prohibited.

2. The presence of arsenic in excess of background concentrations in the deep aquifer is prohibited.

3. The discharge of contaminants through surface runoff to the tidal or non-tidal marsh and/or other surface waters of the State above those levels which can be achieved by a program acceptable to the Board is prohibited.

4. The discharge of wastewater from ground water cleanup operations to waters of the State without obtaining a National Pollutant Discharge Elimination System (NPDES) permit is prohibited.

B. Specifications

1. The discharger shall construct and maintain a monitoring well system in the shallow ground water zone around the site within 100 feet of the 0.05 mg/l concentration line to enable the Board to determine compliance with Prohibition 1, above.

2. The discharger shall construct and maintain a monitoring well system in the deep aquifer to enable the Board to determine compliance with Prohibition 2, above.

3. The treatment or disposal of waste shall not create a nuisance as defined in section 13050(m) of the California Water Code.

C. Provisions

1. Compliance with Prohibitions 1 and 2, above shall be achieved if arsenic concentrations are below the drinking water standard (0.05 mg/l) in the shallow ground water monitoring well system as required in B.1, above, and within background concentrations* in the deep aquifer as measured in an approved ground water monitoring program. Background concentrations of other metals (cadmium, copper, lead, mercury, selenium and zinc) shall be determined using data collected in the first four quarters of monitoring.

* Background arsenic concentrations shall be established from the mean of the data collected from the first four quarters of monitoring the deep aquifer beneath the site. These concentrations may be compared with background data for metals from municipal wells in East Palo Alto, Palo Alto and from the O'Conner Tract Water Company's wells in Menlo Park, although there is some evidence which indicates that the deep aquifer unit in the area of the municipal wells may not be connected to the deep aquifer beneath the site. The dischargers shall use the statistical procedure detailed in the California Administrative Code, Subchapter 15, Article 5 to determine whether background concentrations have been exceeded.

2. The dischargers shall comply with Specifications 1 and 2, above by meeting the following time schedule:

TASK	COMPLIANCE DATE
a. Submit a proposal acceptable to the Executive Officer for the location, construction, sampling and maintenance of the monitoring well systems in the shallow and deep aquifers	November 1, 1985, or 45 days after adoption of State DOHS remedial action plan, whichever date comes first
b. Complete well construction	45 days after approval of a., above
c. Submit first sample results	30 days after completion of b., above

3. The dischargers shall submit by July 1, 1985 a technical report indicating the on-site mitigation methods to be implemented to assure continued compliance with Prohibition 1, above.

4. The dischargers shall comply with Prohibition 3 by implementing the equivalent to Plan B described in Rhone-Poulenc's mitigation report referred to in Finding 15, above. (Plan B primarily consists of grading and paving significant portions of the site and providing improved surface drainage control.) Affected soil in the non-tidal marsh would be removed and replaced and the area revegetated. Measures needed to comply with Prohibition 3 shall be completed by January 1, 1987, or twelve months after adoption of the State DOHS remedial action plan, whichever date comes first.

5. The dischargers shall submit to the Board technical reports on self-monitoring work performed according to a program approved by the Board's Executive Officer.

6. All samples shall be analyzed by laboratories using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

7. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:

a. Entry upon premises on which any pollution sources exist, or may potentially exist, or on which any required records are kept;

b. Access to copy any records requird to be kept under terms and conditions of this Order;

c. Inspection of any monitoring equipment or methods required by this Order;

d. Sampling of any ground water or soil which is accessible, or may become accessible as part of any investigation or remedial action program, to the dischargers.

8. The dischargers shall file a report on any material changes in the nature, quantity or transport of polluted ground water associated with the conditions described in this Order.

9. The dischargers shall maintain in good working order and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

10. The Board will review this Order periodically and may revise the requirements when necessary. This may include further investigation and cleanup if warrented by monitoring results or other considerations.

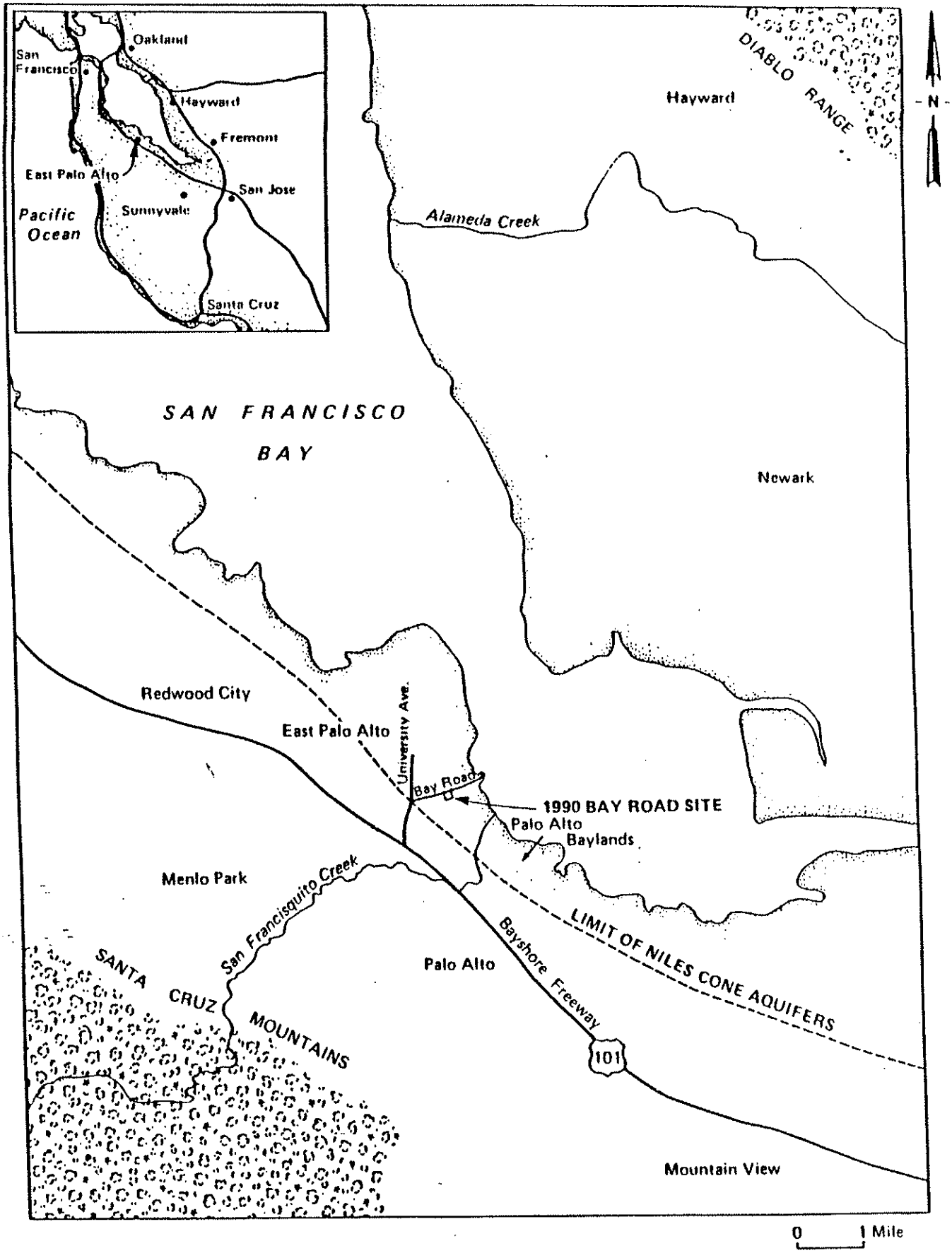
11. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by a letter, a copy of which shall be forwarded to the Board.

12. Cleanup and Abatement Order No's. 82-005 and 83-012 are hereby rescinded.

I, Roger B. James, Executive Officer, do hereby certify the foregoing is full, true and correct copy of and Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on May 15, 1985.

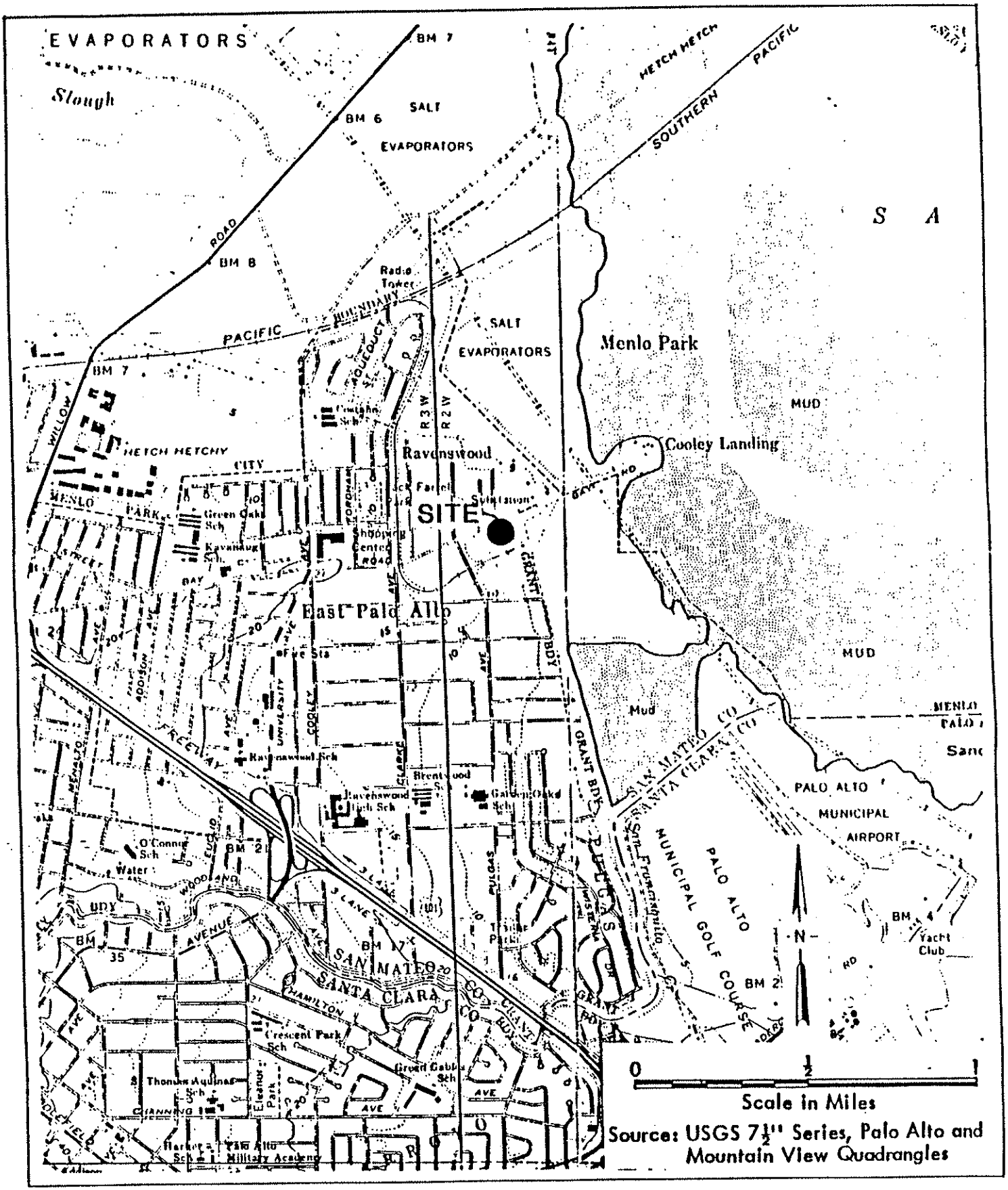
Roger B. James
Executive Officer

Attachments:
Site Maps



LOCATION MAP

Attachment 1

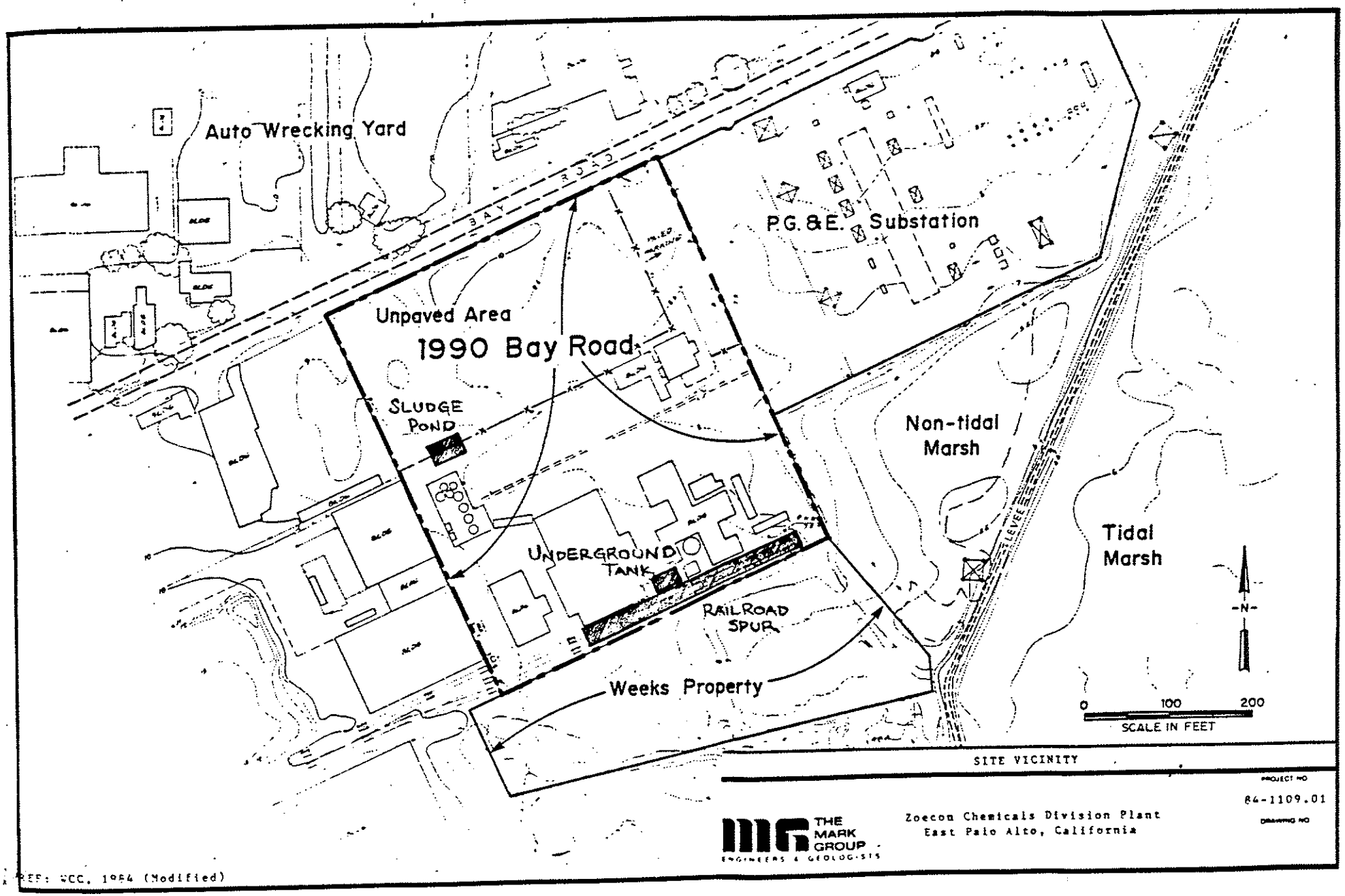


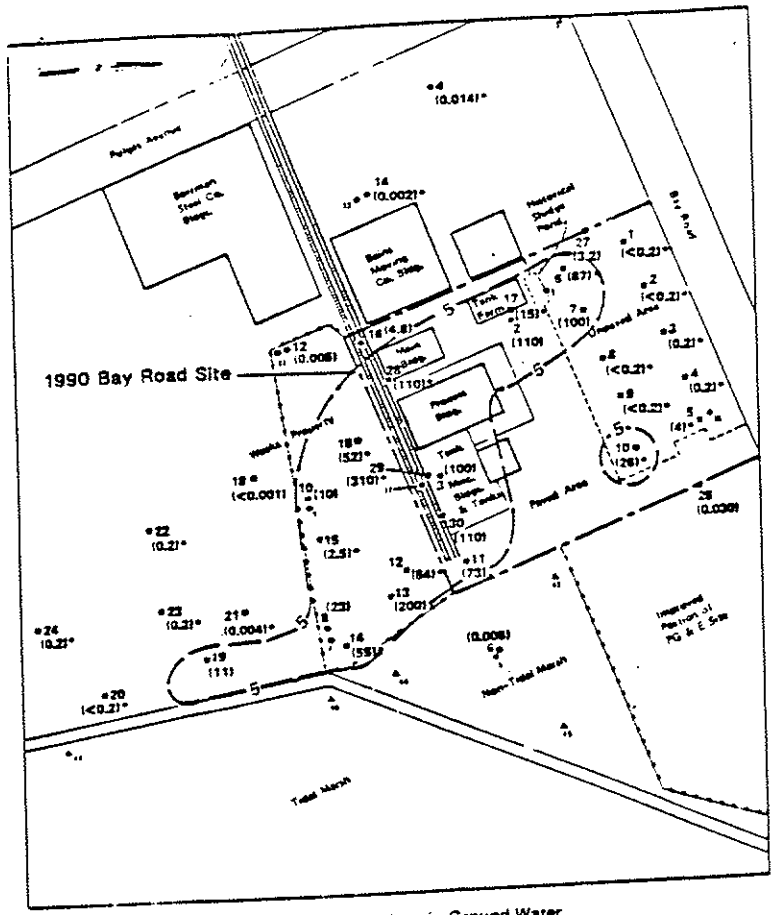
Source: USGS 7½" Series, Palo Alto and Mountain View Quadrangles

LOCATION MAP

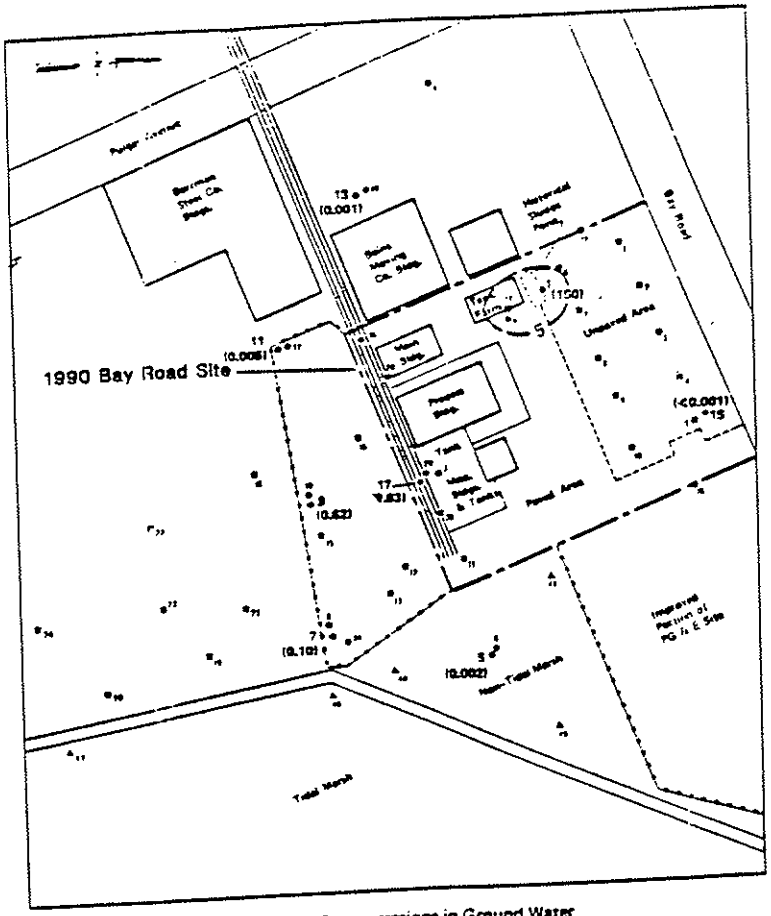
Attachment 2

Attachment 3





Arsenic Concentrations in Ground Water
From Upper Shallow Zone



Arsenic Concentrations in Ground Water
From Lower Shallow Zone

LEGEND

- Fence Line
- Site Boundary
- Railroad Spur
- Converse/TenEch Monitoring Well
- WCC Monitoring Well
- WCC Soil Boring with Piezometer

0 100 200 Feet

Sources: For Converse/TenEch Monitoring wells and borings, Converse/TenEch 1981a, 1981b

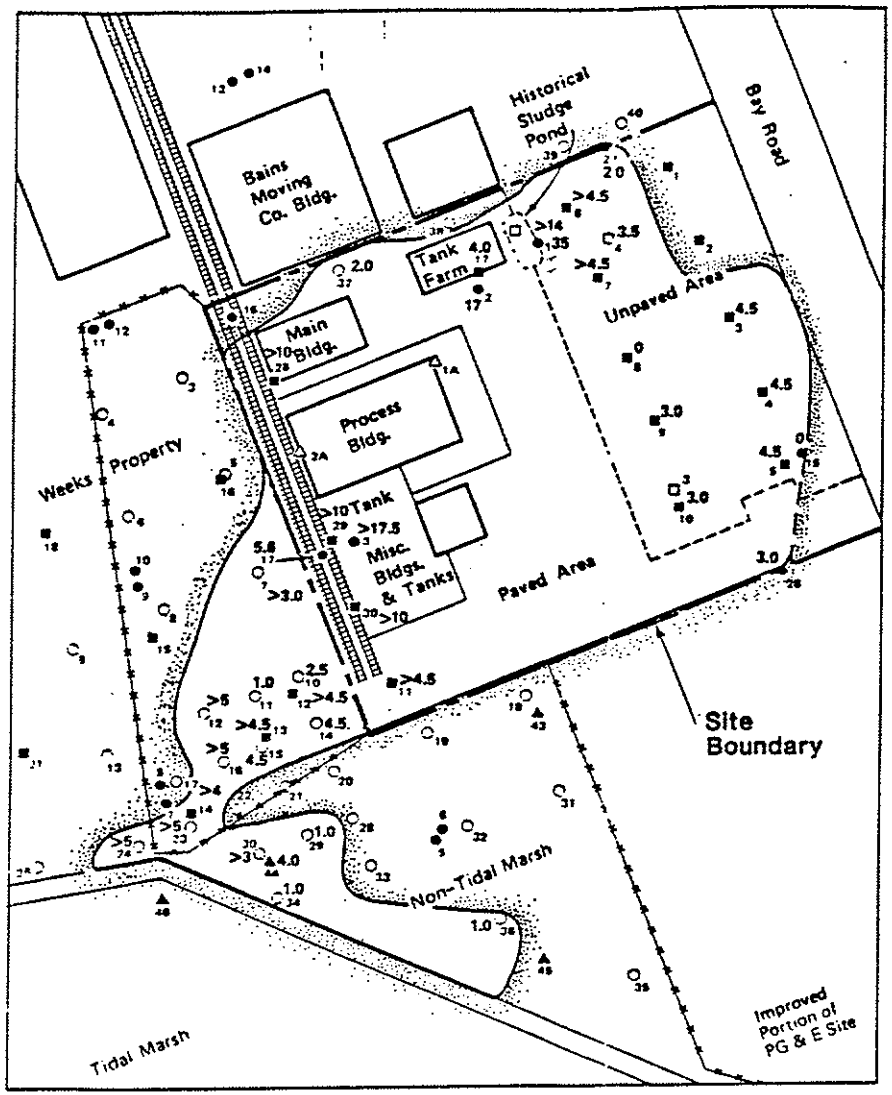
(10) Concentrations are in mg/l; dates of sampling and other information are available in Tables 3 and 4.

(10)* Only chemical data available are those collected by Converse/TenEch.

—5— Estimated contour of arsenic concentration mg/l.

Project No. 30007G	1990 Bay Road	REPORTED TOTAL ARSENIC CONCENTRATIONS IN GROUND WATER IN THE SITE VICINITY	Figure 8
Woodward-Clyde Consultants			

Attachment 4



LEGEND

- Fence Line
- Site Boundary
- Railroad Sour
- Converse/TenEch Monitoring Well
- Converse/TenEch Soil Boring
- Cooper-Clark Soil Boring
- WCC Monitoring Well
- WCC Soil Boring
- WCC Soil Boring with Piezometer

Areal extent of region containing soils with arsenic concentrations in excess of 500 mg/kg wet weight.

Depth to soils containing less than 500 mg/kg wet weight of total arsenic, in feet below land surface.

No symbol at a boring location indicates that all soils tested at that location contained less than 500 mg/kg total arsenic.

NOTE:
The sources for Converse/TenEch monitoring wells and borings are Converse/TenEch 1981a and 1981b.

0 100 200 Feet

Project No. 90007G	1990 Bay Road	REGION WITH SOIL ARSENIC CONCENTRATIONS IN EXCESS OF 500 mg/kg WET WEIGHT	Figure 9
Woodward-Clyde Consultants			

Attachment 5